METABOLIC BONE DISEASE IN ZOO'S COLUMBIFORMS:

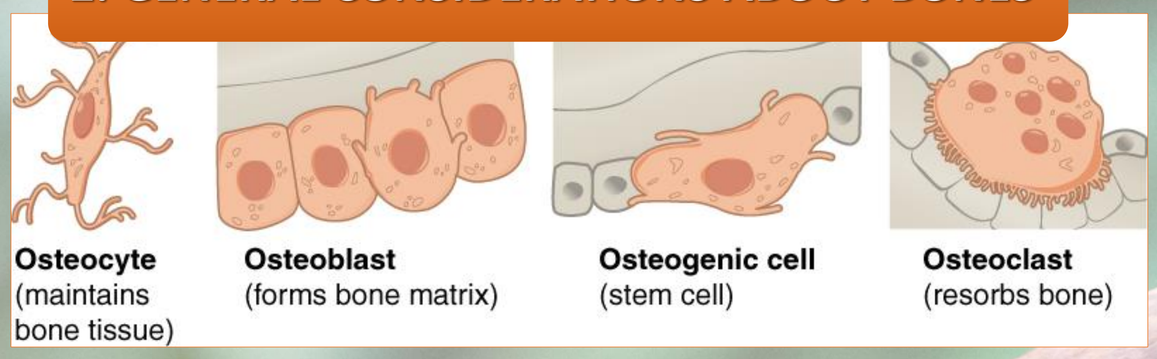
BIBLIOGRAPHIC REVIEW AND CASE REPORT

Verónica Ruiz Abril // Tutor: Jorge Martínez Martínez

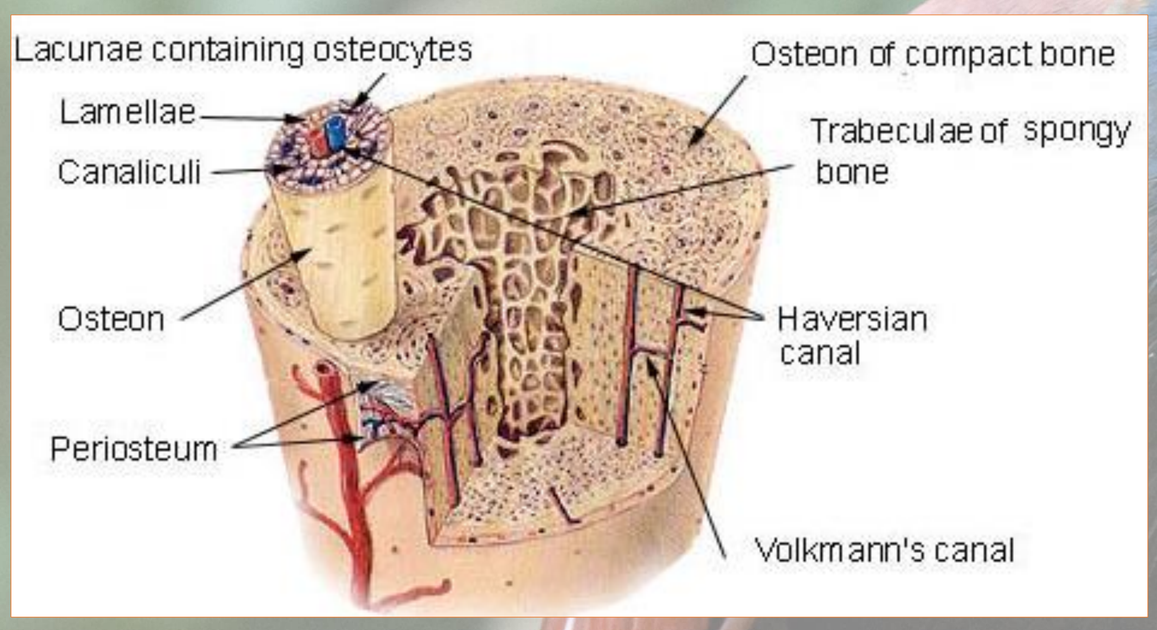
1. INTRODUCTION

- This work is based on the research of the cause of **Metabolic Bone Disease** affecting the species ***Otidiphaps nobilis aruensis*** at Barcelona Zoo.
- For fulfilling this objective a **basic literature review** of bones and its physiology has been made, as well as a list of factors that may affect ossification, emphasizing the deficiency of Vitamin D and calcium.

2. GENERAL CONSIDERATIONS ABOUT BONES



· **Figure 1.** Cellular Elements of Bone Tissue



· **Figure 2.** Bone Matrix

Regulation of Bone Formation and Resorption:

- Systemic hormones
- Local factors (Prostaglandins, Nitric Oxide, Cytokines)

3. ACQUIRED ABNORMALITIES IN SKELETAL GROWTH, DEVELOPMENT, AND REMODELING

- **Malnutrition and Starvation**
- **Overnutrition**
- **Mineral Imbalances**
- **Vitamin Imbalances**

Vitamin D and **Calcium Deficiency**

- Reduced exposure of UVB radiation
- Nutritional Problems
- Etc.

4. METABOLIC BONE DISEASE

- OSTEOPOROSIS
- RICKETS AND OSTEOMALACIA
- FIBROUS OSTEODYSTROPHY

5. CASE PRESENTATION

- Since 1992, **65 chicks have hatched at Barcelona Zoo** (Sierra, 2012). At the time of writing Sierra's (2012) article, **Barcelona Zoo maintained 17·6 birds.**
- **Initial problem:** March of 2014
- **Offspring of an unique couple** (exact number undetermined).
- **Histopathological study seems to point towards a metabolic process.**
- **Procedures are currently being conducted to perform 6 analytics**

DIETARY CHANGES → Calcium and Vitamin D supplementation

MANAGEMENT CHANGES → Sunlight exposure

During these months all pigeons were born without any bone problems

The possibility of an inherited disorder affecting the metabolism of vitamin D is also considered

6. CONCLUSIONS

- The issue described in this case is a **Metabolic Bone Disease**. It has not been managed to classify which kind of MBD it is yet.
- Its most likely **etiology** is from a **lack of calcium and vitamin D** due to **absence of scarcity of UV-B radiation.**
- **Solutions** such as **altering the diet** or **supply UV-B radiation** either artificially or via actual daylight are to be considered, preferably the latter.

Universitat Autònoma de Barcelona

Barcelona